Installation and Operation Guide

It's Under Control®

CP-450

Cool Power® Audio Amplifier

RTI

70-210097-26 V1.0

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FEDERAL COMMUNICATIONS COMMISSION NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the device.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received including interference that may cause undesired operation.

N27917

DECLARATION OF CONFORMITY (DOC)

The Declaration of Conformity for this product can be found on the RTI website at: www.rticorp.com/declaration

SAFETY SUGGESTIONS

Read Instructions. Read all safety and operating instructions before operating the unit.

Retain Instructions. Keep the safety and operating instructions for future reference.

Heed Warnings. Adhere to all warnings on the unit and in the operating instructions.

Follow Instructions. Install and operate in accordance with the manufacturer's instructions.

Accessories. Only use attachments/accessories specified by the manufacturer.

Portable Cart Warning. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

Heat. Do not block any ventilation openings.

Heat. Keep the unit away from heat sources such as radiators, heat registers, stoves, etc., including amplifiers that produce heat.

Power. Unplug this apparatus during lightning storms or when unused for long periods of time.

Power Sources. Connect only to the power cord that was included with the unit.

Power Cord Protection. Route power supply cords so that they are not likely to be walked on or pinched by items placed on or against them, paying particular attention to the cords at plugs, at convenient receptacles, and at the point at which they exit from the unit.

Power Cord Grounding Plug. Do not remove the grounding prong of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

MAINS Outlet. Where MAINS outlets are used, the apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.

MAINS Plug. Where the MAINS plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.

Water and Moisture. Do not use the unit near water—for example, near a sink, in a wet basement, near a swimming pool, near an open window, etc.

Object and Liquid Entry. Do not allow objects to fall or liquids to be spilled into the enclosure through openings.

WARNING!

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THE UNIT TO RAIN OR MOISTURE.

SAFETY SUGGESTIONS

Cleaning. Clean only with dry cloth.

Servicing. Do not attempt any service beyond that described in the operating instructions. Refer all other service needs to qualified service personnel.

Damage Requiring Service. The unit should be serviced by qualified service personnel when:

- Objects have fallen or liquid has been spilled into the unit.
- The power supply cord or the plug has been damaged.
- The unit does not appear to operate normally or exhibits a marked change in performance.
- The unit has been dropped or the enclosure has been damaged.

LIMITED WARRANTY

RTI warrants its products for a period of one (1) year (90 days only for included battery packs); or for a period of time compliant with local laws when applicable from the date of purchase from RTI or an authorized RTI distributor.

This warranty may be enforced by the original purchaser and subsequent owners during the warranty period, so long as the original dated sales receipt or other proof of warranty coverage is presented when warranty service is required. Except as specified below, this warranty covers all defects in material and workmanship in this product. The following are not covered by the warranty:

Damage resulting from:

1. Accident, misuse, abuse, or neglect.
2. Failure to follow instructions contained in this Guide.
3. Repair or attempted repair by anyone other than Remote Technologies Incorporated.
4. Failure to perform recommended periodic maintenance.
5. Causes other than product defects, including lack of skill, competence or experience of user.
6. Shipment of this product (claims must be made to the carrier).
7. Being altered or which the serial number has been defaced, modified or removed.

Remote Technologies Incorporated is not liable for any damages caused by its products or for its failure of its products to perform, including any lost profits, lost savings, incidental damages, or consequential damages.

Remote Technologies Incorporated is not liable for damages based upon inconvenience, loss of use of the product, loss of time, interrupted operation, commercial loss, any claim made by a third party or made by you for a third party.

Remote Technologies Incorporated's liability for any defective product is limited to repair or replacement of the product, at our option.

If any component of your CP-450 Audio Distribution System needs service, please contact Remote Technologies Incorporated by telephone, fax or E-mail for return information. **Please do not return products to Remote Technologies Incorporated without return authorization**.

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CHAPTER 1 | WELCOME

Thank you for using the CP-450 Power Amplifier.

The CP-450 is designed to add more power to an audio distribution system. Equipped with a 50 Watt per channel Cool Power® Amplifier, the CP-450 is perfect for installations that require a couple extra speakers for those bigger rooms and/or adding another room to an audio zone.

The CP-450 is an ideal complimentary component of an RTI control system. The CP-450 provides the amplification for up to four different channels, while RTI audio distribution systems, central processors and user interfaces manage the audio source control, user input, and status feedback. Information such as the selected source, volume level, and tone control settings are available for each zone. Depending on the source equipment used, more advanced information such as song playlists, cover art, and tuner RDS data may also be available. Of course with RTI control systems, audio is just the beginning. Imagine every aspect of your environment working in complete harmony – from audio and video to lighting, ambience, temperature and more. Such scenarios are only made possible from an audio distribution system backed by a professional grade control system. Thanks to the efficient engineering that defines the CP-1650, there is no reason to limit yourself to a system that was designed only for music – with RTI so much more is possible.

IMPORTANT NOTES

Please read these important notes about the CP-450:

- The CP-450 should be placed in an area where it is around normal room temperature (between 60°F to 90°F).
- Avoid installing the CP-450 in a location with little or no air circulation.
- Avoid installing the CP-450 in a location where it can come in contact with direct sunlight.
- Do not let the CP-450 system or get wet. It should not be handled with wet hands or placed in an area where it could get wet.
- Do not subject the CP-450 to smoke, dust, or vibrations.
- Only use the power cord that is supplied with the CP-450. Using the wrong type of power cord may result in damage.
- Do not disassemble the unit. Service of the CP-450 should be performed by authorized personnel only.

IMPORTANT NOTICES TO INSTALLERS

Speaker connections must be completely separate for each channel and have NO common ground connections through any connected devices that share ground.

Some shared ground devices include, but are not limited to, the following:

- Speaker level input on a subwoofer
- Speaker selectors
- Volume controls

Additionally, this product is shipped from RTI with balanced speaker outputs (BTL). Balanced connections reduce noise and eliminate ground loops, which cause hum. When in balanced mode, however, you should not connect the speaker ground connections together, to earth ground, or to another negative terminal.

CHAPTER 1 | PRODUCT CONTENTS

Contents within the box include the following items:

- One (1) CP-450 Audio Distribution System
- Two (2) Four Position Phoenix Connectors
- One (1) Installation Guide
- One (1) Power Cord
- Two (2) Rack Mounting Ears with Screws

UNPACKING AND INSPECTION

After unpacking your new CP-450 Audio Distribution System, save all of the packing materials in case you ever have to ship the unit.

Thoroughly inspect the CP-450 and packing materials for signs of damage. Report any damage to the carrier immediately. Report any equipment malfunctions to RTI or an authorized RTI distributor.

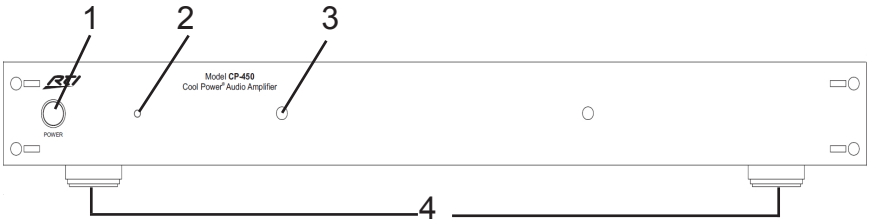
CHAPTER 2 | FEATURES AND DESCRIPTION

The CP-450 provides superior quality and reliability as well as these specific features:

- Four (4)channels.
- Fifty (50) Watts per channel.
- High efficiency BTL amplifier circuitry offers thermal and short-circuit protection.
- Power controlled via RS-232, IR, or voltage trigger.
- Designed with IR output for cascading IR signal paths.
- Rack mountable (1U rack form factor) or free standing.

CHAPTER 2 | FEATURES AND DESCRIPTION

CP-450 FRONT PANEL



1. Power Switch

Turns CP-450 power on or off.

2. Power LED

A blue LED will be lit up when power is on and will be off when the power is off.

3. Zone Power LED

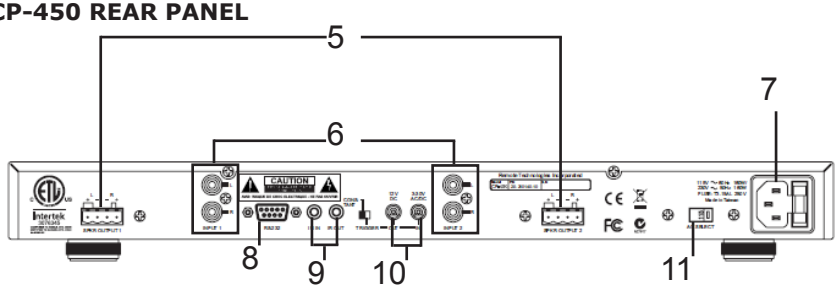
A red LED indicates, when lit, that the corresponding zone is on.

4. Feet

Feet may be placed on the bottom of the CP-450 if the unit is not rack mounted.

CHAPTER 2 | FEATURES AND DESCRIPTION

CP-450 REAR PANEL



5. Speaker Outputs

Two sets of removable stereo connectors for speakers in up to two independent audio zones.

6. Source Inputs

Two (2) sets of left and right RCA jacks from audio sources.

7. AC Power Socket and Fuse

Three-pin grounded socket to connect removable AC power cord with a T2AL 250V fuse.

8. RS-232

DB-9 jack for RS-232 control of the CP-450 from a control system. See Chapter 3 Installation & Operation for RS-232 control details.

9. IR In/Out

The 3.5mm mini IR In jack allows the CP-450 to be controlled by IR. The 3.5mm mini IR Out jack allows for buffered IR output of the IR In for controlling additional CP-450 units in a cascaded configuration.

10. 12V DC Out & 3-30V AC/DC In

The CP-450 can be turned on automatically by an outside trigger when the remote power switch is set to "Trigger." The voltage used to turn on the CP-450 is applied to the "3-30V DC/AC In" socket, and can come from an RTI system controller or another CP-450 (if used in a cascaded configuration). The "12V DC Out" socket provides a +12VDC that can be looped to the "3-30V DC/AC In" socket to trigger another CP-450 in a cascaded configuration.

11. 115/230 AC Voltage Switch

Switch used for toggling between 115 Volts and 230 Volts for certain international locations. The red voltage switch should be left in the 115 Volt position if used within the United States.

CHAPTER 3 | INSTALLATION AND OPERATION

FREE STANDING

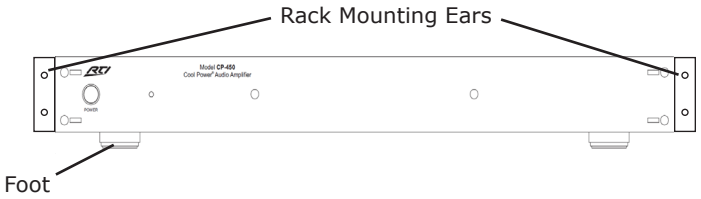
The CP-450 ships with four removable feet that allow the CP-450 to be placed on a flat surface. To maintain proper ventilation and cooling, do not install the CP-450 on a flat surface without the feet.

RACK MOUNT

The CP-450 can be mounted in a component rack using the included rack mounting ears. Align the rack mounting ears with the screw holes located on the sides of the CP-450 near the front. Fasten the rack ears to the

CP-450 using three screws (supplied). Remove feet before mounting in a rack.

NOTE: To maintain proper ventilation, it is recommended that you leave a rack space above and beneath the CP-450.



CONNECTING THE 115VAC POWER CORD

The included AC power cord must be inserted into the AC input receptacle on the CP-450. When the AC power cord is connected to a power source, press the Power button to turn the CP-450 on and off.

IMPORTANT NOTICE FOR INTERNATIONAL DISTRIBUTORS

This product is shipped from RTI with AC voltage set to 115 Volts. The voltage will have to be changed for certain international locations. International distributors should take the following critical step.

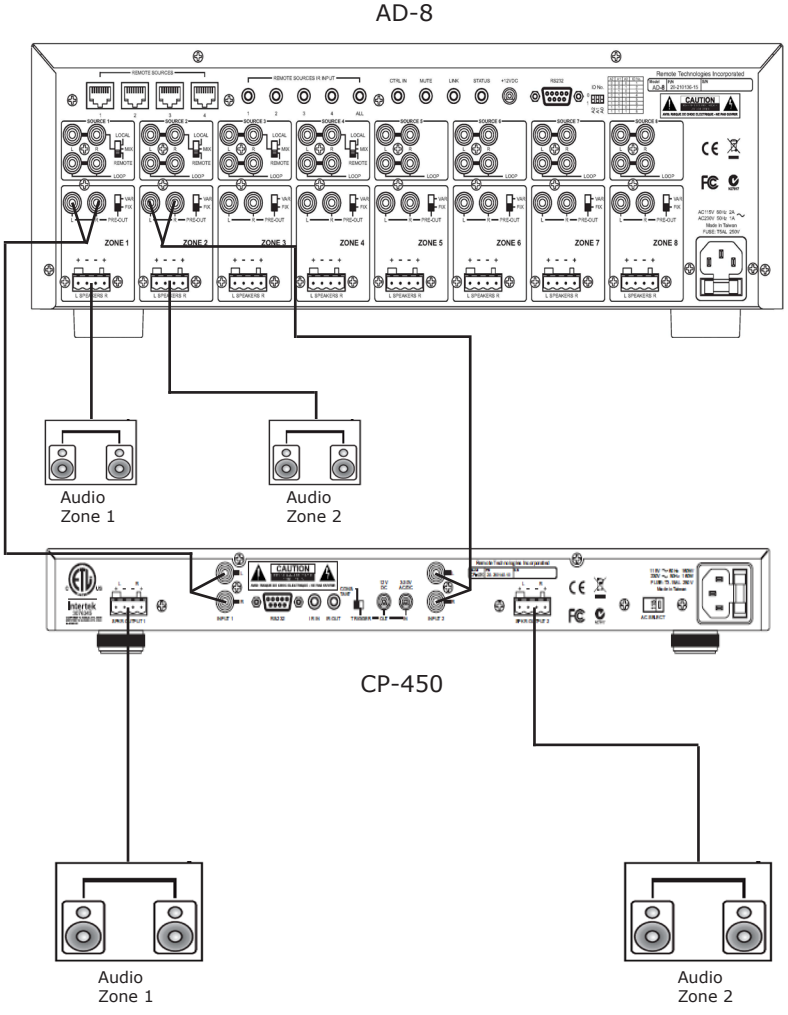
• Ensure that the voltage switch is set properly for your location. The red voltage switch on the rear of the product may need to be changed to the 230 Volt position.

***The red voltage switch should be left in the 115 Volt position if used within the United States.**

CHAPTER 3 | INSTALLATION AND OPERATION

CONNECTING AUDIO SOURCES

The CP-450 has two sets of RCA audio inputs for connecting up to two external source components. These two audio sources can be selected to play in up to two zones. A user in one zone can listen to one audio source while another user in a different zone listens to a different audio source. Also, if users in more than one zone choose the same audio source, control of that source is shared between the zones (the RTI AD-8 audio distribution system is shown here).



CHAPTER 3 | INSTALLATION AND OPERATION

SPEAKER WIRE TERMINATION

Install the two supplied phoenix connectors into the speaker outputs on the CP-450. Connect the positive and negative wires for each audio channel output, keeping the proper orientation of positive and negative signal for each speaker connection. Typically, two-conductor speaker wire uses red to denote positive and black to denote negative. Some types of wire indicate positive with a line running through the insulation. Four-conductor wire can also be used. This has four separated wires in one outer jacket, making it possible to run a single speaker wire to a zone for its pair of speakers. This type of wire typically uses red and black for one speaker and white as positive and green as negative for the second speaker.

IR CONTROL OF CP-450

A discrete set of IR codes is available within the RTI Integration Designer programming software or on the RTI website (accessible to RTI dealers only). A 3.5mm mono mini jack labelled IR In is located on the rear of the CP-450. All IR commands received are looped out through the IR Out jack.

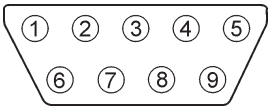
RS-232 CONTROL OF CP-450

A DB-9 jack offers RS-232 control of the CP-450 from an RTI or third-party home automation control system or a PC running a hyperterminal program. A set of RS-232 codes is available within the RTI Integration Designer programming software or on the RTI website (accessible to RTI dealers only).

Connection Settings:
Baud rate: 9600
Data bits: 8
Parity: None
Stop bits: 1

DB-9 Jack Pinout:

1	DCD	Carrier Detect
2	TXD	Transmit Data
3	RXD	Receive Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	N/C	Not Connected



CHAPTER 3 | INSTALLATION AND OPERATION

TRIGGER/CONSTANT SWITCH

When the Trigger Switch is set at "Trigger," the Power Button toggles the CP-450 between the "Standby" and "Off" modes. The 12V DC trigger toggles the CP-450 between "Standby" and "On" modes.

When the Trigger Switch is set to "Constant," press the Power Button to switch the CP-450 "On" or "Off." When the CP-450 is in "Constant" mode, both RS-232 and IR can switch the CP-450 between "Standby" and "On" modes.

NOTE: The Trigger/Constant switch must be set to the Constant position for IR control. IR does not work if the switch is in the Trigger position.

CHAPTER 4 | SPECIFICATIONS

GENERAL

Power Supply	115V AC or 230V AC (Switchable)
Power Consumption	160W
Trigger Output (Status)	One, 12VDC @ 15mA
Mounting	Rack mount or free standing
Dimensions (W x H x D)	17” X 2” X 13.75” (431.8 mm X 50.8 mm X 349.25 mm)
Weight	9.47 lbs (4.3 kg)
Warranty	One Year (Parts & Labor)

All specifications subject to change without notice.

AUDIO - 2 CHANNEL MODE

Rated Power / Channel	50 Watts, 20Hz to 20KHz (RMS, 2 channels driven into 8 ohms)
Rated Power/ Channel	70 Watts, 20Hz to 20KHz (RMS, 2 channels driven into 4 ohms)
IHF Dynamic Power	80W/1KHz at 8 ohm load 120W/1KHz at 4 ohm load
Total Harmonic Distortion @ 50W/8 ohms & 70W/4 ohms	0.5%
Total Harmonic Distortion @ 1W/8 ohms	0.05%
S/N @ Rated power, IEC A-wtd, Source Input Shorted	100dB
Frequency response 20Hz to 20KHz @ 1W/8 ohms	0dB+/-0.5dB
Input sensitivity for 1W/ 8 ohms	140mV/1V
Input Impedance	22K ohms
Channel Separation @Rated Power /1KHz	85dB
Crosstalk Between Sources @ Rated Power/1KHz	100dB
Crosstalk Between Zones @ rated power /1KHz	95dB

All specifications subject to change without notice.

CHAPTER 5 | TROUBLESHOOTING

If you are having problems with your CP-450 Audio Distribution System, please read the information below before contacting technical support.

If you continue to have problems, see Chapter 6 for more information on contacting RTI technical support.

CP-450 DOES NOT FUNCTION PROPERLY

Symptom: No sound
Possible Causes:
- AC power unplugged > Check AC cable and outlet.
- Main power switch not on > Is main power light on?
- Outlet has no power > Verify outlet has power.
- Blown fuse > Check main fuse.

Symptom: No sound from individual zones.
Possible Causes:
- Faulty wiring > Verify all wiring.

Symptom: No IR control of CP-450.
Possible Causes:
- Faulty wiring > Jack is 1/8" mono, tip = IR+, ring=Gnd.
- IR signal level > Adjust IR signal going into CP-450.
- IR In > Verify connection is to IR In.
- The Trigger/Constant Switch > Verify switch is set to Constant.

Symptom: No RS-232 control of CP-450.
Possible Causes:
- Faulty wiring > Check RS-232 pinout.
- Incorrect string > Verify string from manual.
- No carriage return > String requires carriage return.

CHAPTER 6 | SERVICE AND SUPPORT

For news about the latest updates, new product information, and new accessories, please visit our web site at:

www.rticorp.com

CONTACTING RTI

For general info, you can contact RTI at:

Tel. (952) 253-3100
Fax (952) 253-3131
info@rticorp.com

RTI TECHNICAL SUPPORT

At RTI, customer service and satisfaction is an utmost priority. If you are encountering any problems or have a question about your RTI product, please contact RTI Technical Support for assistance.

RTI provides technical support by telephone, fax or e-mail. For the highest quality service, please have the following information ready, or provide it in your fax or e-mail.

- Your Name
- Company Name
- Telephone Number
- E-mail Address
- Product model and serial number (if applicable)

If you are having a problem with hardware, please note the equipment in your system, a description of the problem, and any troubleshooting you have already tried.

If you are having a problem with software, please note what version you have installed, the operating system on your PC, a description of the problem, and any troubleshooting you have already tried.

If you are calling about a software or programming question or problem, please be at you computer when you place your call. This will considerably speed up the troubleshooting process.

For technical support or assistance with your CP-450, software, or accessories, contact RTI at:

(952) 253-3137
support@rticorp.com
www.rticorp.com

For questions regarding service or repair of your CP-450, contact RTI at:

(952) 253-3136
service@rticorp.com
www.rticorp.com

Please do not return products to RTI without return authorization.

CHAPTER 6 | SERVICE AND SUPPORT

Shipment of CP-450 for Service

RTI will pay all labor and material expenses for all repairs covered by this product's warranty. If necessary repairs are not covered by warranty, or if a unit is examined which is not in need of repair, you may be charged for the repairs or examination.

If it is necessary to ship the CP-450 for service:

- Please pack it securely (we suggest that it be insured).
- Do not include accessories such as power cords or manuals unless instructed to do so.

You must pay any shipping charges incurred in getting your CP-450 to RTI. RTI will pay reasonable return shipping charges via a carrier of our choice to any destination within the United States if the repairs are covered under warranty.

A copy of the original dated sales receipt must be provided whenever warranty service is required. You will need this receipt to establish the date of purchase.

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Remote Technologies Incorporated
5775 12th Avenue East, Suite 180
Shakopee, MN 55379
Tel: 952-253-3100
Fax: 952-253-3131
www.rticorp.com

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